FINAL PROJECT

THE EFFECT OF ADDING GINGER WATER ON THE TENSILE STRENGTH AND MOISTURE ABSORPTION OF PVA MATRIX COMPOSITES REINFORCED BY GINGER NANOCELLULOSE FIBERS AND/OR ZnO

Proposed As One of the Requirements to Complete the Mechanical Engineering Bachelor Program at Andalas University

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ABSTRACT

The use of environmentally friendly materials has become an important thing in today's times. This is because there has been a lot of natural damage that has occurred due to the use of materials that cannot be recycled. PVA is a type of polymer that is soluble in water and is environmentally friendly. Many types of research have been conducted on the manufacture of PVA-based composite films with natural fibers as reinforcement, one of which is ginger nanocellulose fibers. In this study, PVA is dissolved using a mixture of 25% distilled water and 75% ginger water with Ginger nanocellulose fibers and/or Zinc Oxide (ZnO) as reinforcement. The purpose of this study was to see the effect of adding ginger water on the tensile strength and moisture absorption of PVA matrix composite film with Ginger nanocellulose fiber and/or ZnO as reinforcement.

From the results of the tests conducted, it can be seen that the addition of ginger water with PVA obtained the best results compared to the addition of ginger water to PVA which is reinforced by Ginger nanocellulose fibers and/or ZnO. The addition of ginger water with PVA resulted in tensile strength of 28.33 ± 4.32 MPa and moisture absorption of 9.10 ± 0.37%. The cause of this happens because ginger water can damage the ZnO bonds and Ginger nanocellulose fibers against PVA.

Keywords : Ginger Water, Ginger Nanocellulose Fibers, ZnO, PVA, Tensile Strength, Moisture Absorption